

REMARKS

In the Office Action, the Examiner noted that claims 1-39 are pending in the application and that the claims are rejected over a prior art reference. By this response, claim 1 has been amended and remains supported by the specification; and claims 16, 19, 21, 22, 27 and 31 are amended to provide proper antecedent basis. Thus, claims 1-39 remain pending in the application. Applicant respectfully traverses the rejections for the reasons indicated below.

First Rejection under 35 U.S.C. § 103(a)

Claims 1, 10-12, 16, 21, 22, 27, 31 and 35-39 are allegedly rejected under 35 U.S.C. § 103(a) as being unpatentable over Robbins (US Publication Number 2002/0197501), hereafter "Robbins."

Applicant respectfully disagrees and submits that Robbins does not describe the presently claimed invention. Applicant discusses the rejection below as it applies to independent claim 1 and dependent claims 10-12, 16, 21, 22, 27, 31 and 35-39.

Without conceding that Robbins discloses any of the features of the present invention, Robbins does not disclose or suggest a method of "depositing a first material on the surface of a metal substrate to form a ... seed layer of the first material" followed by "epitaxially depositing a metal oxide over the seed layer ... from a solution-based precursor ... under second conditions that are more oxidizing," as recited by independent claim 1.

Robbins describes "an article that acts as a support or substrate layer for subsequent deposition of layers by reactive sputtering," comprising "a biaxially textured metal substrate; and a layer of palladium deposited on at least one major surface of said metal substrate." (*See* Robbins, [0006] & [0021]). Robbins also teaches deposition of "[s]ubsequent layers comprised by either a seed layer of CeO₂ ('seed layer') or a three layer system comprising a seed layer, a layer of YSZ and a cap layer of CeO₂ ('cap layer') ... by reactive sputtering techniques." (*See* Robbins, [0074]). The Examiner suggests that the palladium layer in Robbins constitutes a seed layer, and the deposition of the subsequent layers constitutes deposition of a second material over a seed layer.

Robbins does not provide any motivation or suggestion to use “a solution-based precursor” for “depositing a metal oxide over the seed layer,” as recited in claim 1. Robbins discloses deposition of metal oxide layers by reactive sputtering and provides conditions that are sufficient to form oxides of the sputtered metal. In contrast, the claimed methods recites conditions for “depositing a metal oxide layer...from a solution-based precursor,” which are sufficient to decompose the precursor solution in addition to providing an oxygen partial pressure sufficient to form a metal oxide. Robbins does not teach or suggest that such a process is desirable, or even possible.

Furthermore, Robbins does not provide any guidance as to conditions suitable for “epitaxially depositing a metal layer...from a solution-based precursor,” namely, “second conditions that are more oxidizing than the reducing conditions used in the deposition of the first material, and wherein the atmosphere of the second conditions comprises a water partial pressure in the range of about 4 torr to about 40 torr.” While admitting that Robbins does not disclose second conditions comprising “a water partial pressure in the range of about 4 torr to about 40 torr,” the Office Action nonetheless suggests that such water partial pressures could be ascertained from “routine experimentation.” Applicants submit that no fruitful experimentation is possible until one realizes that deposition is accomplished from a solution-based precursor, a possibility on which Robbins is completely silent.

In view of the arguments presented above for the independent claim 1, the Applicant respectfully submits that the corresponding dependent claims 10-12, 16, 21, 22, 27, 31 and 35-39 are allowable for the reasons discussed above as well as additional limitations recited in each dependent claim also interpreted in combination. In view thereof, Applicant respectfully submits that the claims are patentable over Robbins, and respectfully request that the rejection under § 103(a) be withdrawn.

Second Rejection under 35 U.S.C. § 103(a)

Claims 2, 9, 16, 26, 28, 29 and 32 are allegedly rejected under 35 U.S.C. § 103(a) as being unpatentable over Robbins (US Publication Number 2002/0197501), hereafter “Robbins.”

Applicant respectfully disagrees and submits that Robbins does not describe the presently claimed invention. Applicant discusses the rejection below as it applies to independent claim 2 and dependent claims 9, 16, 26, 28, 29 and 32.

Claim 2 is directed to a method of making a multilayered article including “depositing a ceria layer...from a solution-based precursor.” For the reasons presented above for independent claim 1, it is submitted that Robbins does not disclose or suggest deposition of a ceria layer from a solution-based precursor. Furthermore, Robbins does not disclose or suggest “epitaxially depositing a ceria layer having a termination plane over the seed layer, at least 25% of the termination plane of the ceria layer comprising the (001) plane,” as recited by independent claim 2. Termination plane refers to the crystallographic orientation of the upper surface of the ceria layer. Robbins is silent as to the existence and the nature of the termination plane of the CeO₂ layer and certainly does not disclose a termination plane with an orientation in a desirable direction (e.g., (001)) let alone a method for epitaxial deposition of such a layer.

In view of the arguments presented above for the independent claim 2, the Applicant respectfully submits that the corresponding dependent claims 9, 16, 26, 28, 29 and 32 are allowable for the reasons discussed above as well as additional limitations recited in each dependent claim also interpreted in combination. In view thereof, Applicant respectfully submits that the claims are patentable over Robbins, and respectfully request that the rejection under § 103(a) be withdrawn.

Third Rejection under 35 U.S.C. § 103(a)

Claims 3-8, 13-15, 17-20, 23-25, 29, 30, 33 and 34 are allegedly rejected under 35 U.S.C. § 103(a) as being unpatentable over Robbins (US Publication Number 2002/0197501), hereafter “Robbins.”

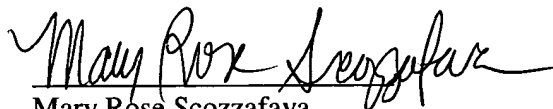
Applicant respectfully disagrees and submits that Robbins does not describe the presently claimed invention. Claims 3-8, 13-15, 17-20, 23-25, 29, 30, 33 and 34 depends directly or indirectly from independent claims 1 and 2, and is deemed to be allowable for the reasons discussed above as well as the additional limitations cited therein.

In view of the explanation presented above, the Applicant respectfully submits that claims 1-39 are allowable, and respectfully requests an early and favorable reconsideration and allowance.

Applicant respectfully requests an early and favorable reconsideration and allowance of claims 1-39. The Examiner is encouraged to contact the undersigned to expedite prosecution of the application. No fees are believed to be due with this reply. However, please charge any fees or credit any overpayments to Deposit Account No. 08-0219.

Respectfully submitted,

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